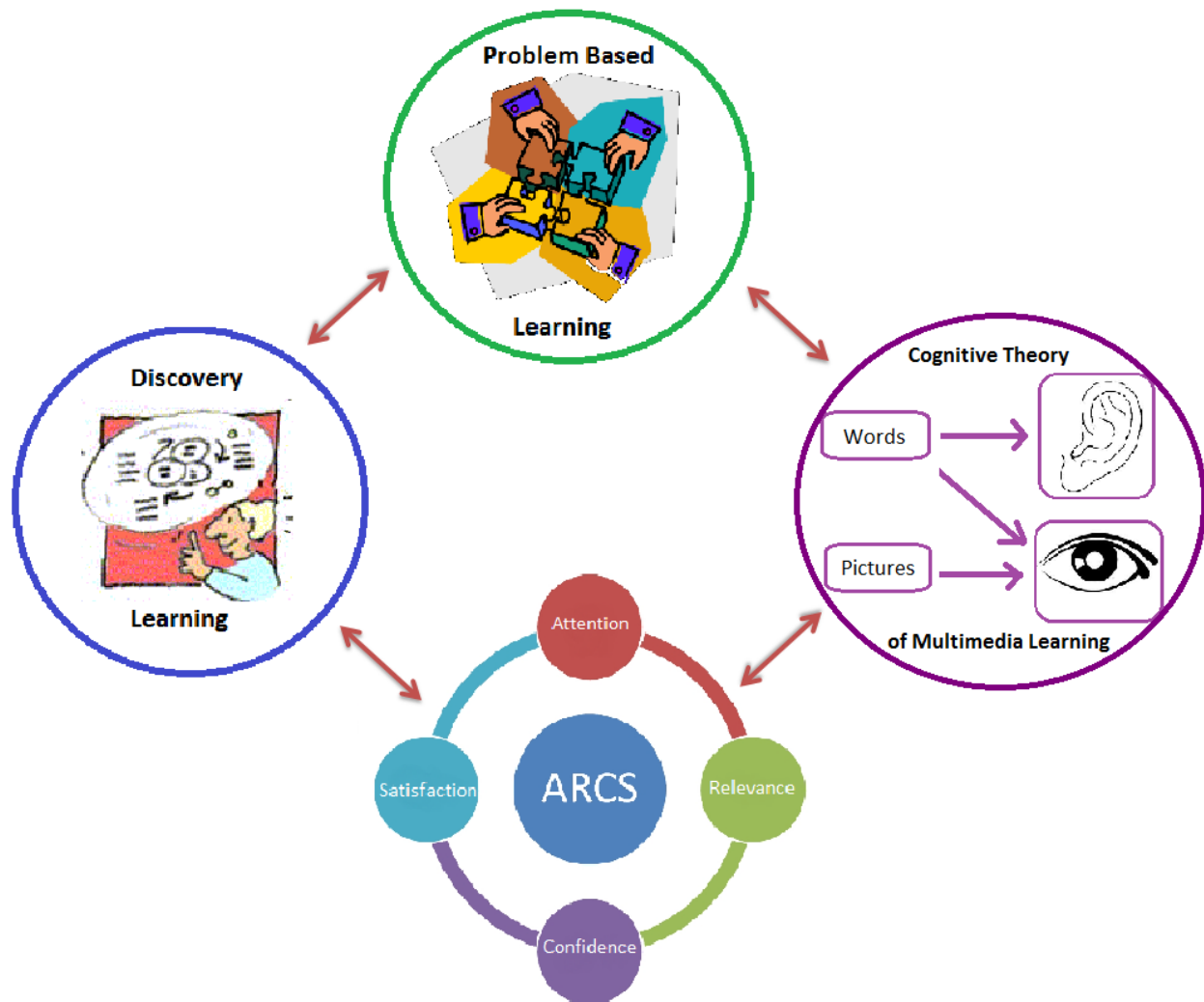


# Learning Theories Summary

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## Problem Based Learning

Problem based learning involves students applying their knowledge by investigating new situations to find solutions. This learning approach allows for critical thinking and the development of problem solving skills. I believe problem solving skills are important for everyone to have, and by giving students challenging problems, it allows them to make connections and apply their knowledge to new real-life situations. In math, it is common for students to demand reasons for their learning of certain mathematical concepts. Problem-based learning gives students a new perspective in math, in which they have to be more open-minded to apply their knowledge to more challenging problems that can be based on real-life situations. Problem based learning allows for group work and active, hands-on learning and also allows the teacher to be a facilitator, in which the teacher guides the students in the correct direction.

### **Discovery Learning (Bruner)**

Discovery Learning is inquiry –based and allows students to discover new facts through problem solving situations. Discovery learning allows students to be more investigative as they explore problems and discover new information in the process. I believe it's common for teachers to simply spoon feed their students with information, which does not give students the opportunity to be independent and self-directed learners but rather dependant learners. As the students reflect back to existing knowledge and discover facts and relationships between concepts, I believe students are more likely to understand the concepts and ideas because they are actively making the connections and discovering new knowledge. It is important to assess the students' findings to make sure they are on track. This learning approach can lead to class discussions as the students work together in connecting their knowledge.

### **ARCS Model of Motivational Design (Keller)**

The ARCS Model of Motivational Design includes four steps for promoting and maintaining motivation in the learning process: Attention, Relevance, Confidence, and Satisfaction. Math is not the most popular subject of study; this may be because of the difficulty, students' lack of interest, students' belief that they will never need math, negative past experiences, and many other reasons. Firstly, it is very important to have the students' attention and interest in the topic otherwise they will not want to learn it at all. Using a manipulative, new ways to present information, making activities fun by using games and challenging students are different ways to get their attention. Making the math relevant to the students gives them a more meaningful purpose to learn the topics. I think if students work on problems that they can relate to or if they believe that they will use it in the future then they will be more interested and motivated to learn. Lastly, students need feedback and also praise because they want to know if they are doing work correctly. Giving the students constructive feedback, letting them know what parts were correct and pointing them in the right direction to correct any errors gives the students the confidence and the satisfaction that they are on the right track and that they can succeed.

### **Cognitive Theory of Multimedia Learning (Mayer)**

Cognitive Theory of Multimedia Learning involves the idea of learning through auditory and visual methods as our brains process the information through organization. People learn more effectively through words and pictures as opposed to words alone, and learning is an active process of filtering, selecting, organizing, and integrating information based upon prior knowledge. Including visual representations in the learning of math is necessary. For example, learning about graphs involves seeing and creating graphs. Pictures can help students understand concepts more effectively and can be beneficial for students to visualize the scenario when solving problems. Also writing key concepts down for students to see, as opposed to just stating it, allow the students to process the information to make connections to existing knowledge.